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INTRAINDUSTRY INFORMATION TRANSFERS ASSOCIATED WITH THE REPURCHASE OF COMMON STOCK

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INTRODUCTION

In recent years, numerous studies have directed attention to the phenomenon of information transfers, i.e., abnormal returns associated with one firm in response to another firm's announcement. Most of this research has focused on earnings related information releases and their effect on other firms in the same industry. However, nonearnings information has also been related to information transfers. This research extends this literature by reexamining information transfers associated with repurchases of common stock and finding some support for the phenomenon.

Prior research

Recently, Joh and Lee [1991] suggested voluntary disclosures provide information that may have both firm-specific and industry related components. Several researchers have found that announcements of earnings resulted in significant abnormal returns for both the announcing firm, i.e., information content, and for other related firms in the same industry, i.e., information transfer [Firth, 1976; Foster, 1981; Clinch and Sinclair, 1987; Freeman and Tse, 1992]. Consistent with the views of Joh and Lee, Freeman and Tse [1992] examined early and late earnings announcements and suggested that early announcements could be used to predict late announcements.

Management forecasts of earnings also have been associated with information transfers. Baginski [1987] developed groups of firms similar to the announcing firms by clustering on a set of four risk variables. In general, firms in the same risk class as the announcement firm demonstrated significant abnormal returns in association with management's forecasts of earnings. Several other researchers supported these findings by confirming information transfers associated with earnings forecasts [Pownall and Waymire, 1989; Han et al., 1989; Pyo and Lustgarten, 1990]. Pownall and Waymire [1989] characterized these information transfers as weak and variable responses.

Several researchers have suggested the stronger the relationship among firms, the more likely it is to discover information transfers [e.g., Joh and Lee, 1991; Karafiath and Glascock, 1989; Asness and Smirlock, 1991]. Foster [1981] increased the magnitude of information transfers associated with earnings announcements by redefining the related firms as those in both the same industry and line-of-business as the announcing firms. Freeman and Tse [1991] found the magnitude of the information transfers associated with earnings announcements to be dependent on earnings comovement within the industry. Frost [1990] also found that similarity of the firms and concentration of the industry enhanced the correlation, between information content and information transfers associated with earnings announcements.

Although a major portion of information transfer research has concentrated on earnings, voluntary disclosure models have suggested nonearnings information may also be related to information

transfers [Dye, 1990; Wagenhofer, 1990]. For instance, a firm's decision to reposition itself within its industry by becoming more, or less, aggressive in its use of leverage might contain both firm-specific and industry related information. Announcements of issues of common stock have been associated with significant negative abnormal returns for announcement firms [Asquith and Mullins, 1986; Masulis and Korwar, 1986]. Szewczyk [1992] extended these findings by demonstrating small negative abnormal returns for other firms in the issuing firm's industry.

Announcements of cash tender offers for the repurchase of common stock has been associated with strong positive abnormal returns for the announcing firm [Masulis, 1980; Dann, 1981; Vermaelen, 1981]. Hertzal [1991] extended these findings by attempting to discover information transfers, but he was unable to demonstrate significant abnormal returns associated with other firms in the announcement firm's industry. These findings were surprising given that a positive correlation between earnings and repurchase announcements had been demonstrated [Dann et al., 1991; Hertzal and Jain, 1991].

Schipper [1990] suggested that failure to find information transfers was not compelling evidence of their nonexistence. Furthermore, Guenther and Rosman [1994] voiced a word of caution in interpreting information transfer research. They repeated the Freeman and Tse [1991] study but altered the definition of industry from the four-digit Standard Industrial Classification (SIC) code taken from COMPUSTAT to the four-digit SIC code taken from the Center for Research in Security Prices (CRSP) daily returns file. The information transferred reported by Freeman and Tse, and confirmed by Guenther and Rosman, disappeared with the redefinition of industry. Hertzal [1991] used the four-digit SIC code provided by CRSP to define industry. This, and other factors such as the possible leakage of information prior to the announcement, may have influenced his results.

The purpose of this study is to reexamine cash tender offers associated with the repurchase of common stock in order to determine whether there is any potential for further research and to suggest some possible directions for further inquiry. The results are weakly supportive of information transfers associated with announcements of cash tender offers for the repurchase of common stock. Furthermore, they suggest that the repurchase of common stock is a complex financial transaction. Future research should consider controlling for method of repurchase, motivation, premium, and percentage of outstanding shares repurchased.

DATA AND METHOD

Sample selection

The initial sample of cash tender offers for the repurchase of common stock was collected from the General News section of the Wall Street Journal Index and confirmed by examination of the related Wall Street Journal (WSJ) article. The selection criteria minimized selection bias and avoided several methodological issues without being unnecessarily restrictive. First, New York Stock Exchange (NYSE) and American Stock Exchange (ASE) firms had to have announced repurchases between February 1983 and 1987. Drawing the sample from the NYSE and ASE avoided possible nonsynchronous trading problems associated with over-the-counter firms [Lev, 1979]. The time period selected restricted the sample to a single market phase that reduced variation and avoided linearity problems [Spiceland and Trapnell, 1983]. Second, firms had to have at least 200 days of CRSP daily returns available with no missing data in the 15 day event window to provide reliable estimates. Third, relevant nonannouncement firms were members of the same four-digit SIC code as defined by Standard and Poor's COMPUSTAT service. Finally, neither announcement firms nor nonannouncement firms could have other significant announcements during the 15 day event window such as earnings, forecasts of earnings, unanticipated dividends, merger or restructuring activity such as the issue or repurchase of securities other than the subject security.

The final sample of 259 firms consisted of 32 announcement firms and 227 nonannouncement firms. The announcements occurred across 25 industries with 207 of the nonannouncement firms occurring in the sample once. The sample was well distributed without over-dependence on a small group of industries or firms.

Formation of subindustry portfolios

The most effective research designs for investigating information transfers have involved some meaningful relationships among firms. One tactic has been to form subindustry groups of relatively homogeneous firms. Foster [1981] found that examination of firms with the majority of earnings originating from the same line of business as the announcing firm increased the magnitude of the information transfers associated with earnings. Pyo and Lustgarten [1990] found that firms with a significant covariation of earnings demonstrated information transfers in response to forecasts of earnings. Baginski (1987) took a different approach and developed portfolios of firms in the same risk class as the announcement firms and demonstrated information transfers among those "similar" firms associated with forecasts of earnings.

Since the repurchase of common stock is a leverage increasing transaction, Baginski's [1987] approach of forming subindustry portfolios based on risk characteristics was used. Ward's [1963] clustering algorithm based on the squared Euclidean distances of four risk variables (α_i , β_i , σ_e^2 , D/S) was used to develop portfolios of similar and dissimilar firms (see Bradford 1989 for details). The market model parameters (α_i , β_i) and the variance of the error term (σ_e^2) were used to capture the nondiversifiable and diversifiable aspects of business risk based on nine years of COMPUSTAT monthly returns prior to the first announcement (1974-1982), respectively. The debt to equity ratio (D/S) was added to give weight to the leverage component of risk and was calculated from COMPUSTAT annual industrial data as a "book to market" ratio [Bowman, 1980].

The measurement of abnormal returns

Abnormal returns were calculated according to Patell [1976] within a seemingly unrelated regressions framework [Zellner, 1962] to control for possible cross-sectional dependence among portfolios [Bernard, 1987]. Following Baginski [1987], the portfolio returns were calculated as equally-weighted cross-sectional mean returns (1) for each of the three portfolios containing announcement firms, similar firms, or dissimilar firms. The announcement date (day 0) was defined as the date of publication of the announcement in the WSJ. Abnormal returns (3) were calculated for each of the 15 days surrounding the announcement (day -7 to day 7) based on the market model (2) parameters (α_p , β_p) from the 238 day estimation period surrounding the event window (days -126 to -8 plus days 8 to 126) [see Patell, 1976].

$$R_{pt} = \frac{1}{N} \sum_{i=1}^N R_{it} \quad (1)$$

$$\mathbf{y} = \Gamma \mathbf{x} + \zeta \quad (2)$$

$$\hat{e} = R_{pk} - \left(\alpha_p + \beta_p \cdot R_{mk} \right) \quad (3)$$

where, R_{it} , R_{pt} , and R_{pk} = returns for firm i or portfolio p on days t or k ,
 R_{mt} and R_{mk} = CRSP value weighted index for days t or k ,
 \mathbf{y} = 3x1 vector of portfolio returns (R_{pt}),
 Γ = 3x2 matrix of market model parameters (α_p , β_p),

- \mathbf{x} = 2x1 vector of market model variables $\begin{bmatrix} 1 \\ R_{mt} \end{bmatrix}$,
 ζ = 3x1 vector of market model error terms (e_{pt}),
 α_p and β_p = estimated intercept and systematic risk for portfolio p,
 \hat{e}_{pk} = prediction errors (abnormal returns) for portfolio p on day k,
N = number of firms in portfolio p,
t = 238 day estimation period (t = -126, -125, ..., -8 and 8, 9, ..., 126), and
k = 15 day event window (k = -7, -6, ..., 0, ..., 7).

Following Patell [1976], the abnormal returns, or prediction errors, were standardized by division with the standard error of the predicted value (4) to form the standard prediction errors (5). The significance of the standardized prediction errors (SPE_{pk}) for each day in the event window was determined for each portfolio using normalized sums (Z_{spe}). The standardized prediction errors have a t-distribution with $T_p - 2$ degrees of freedom and the normalized sums have a unit normal distribution.

$$s_p = \left[\left(\frac{\sum_{p=1}^{T_p} e_{pt}^2}{T_p - 2} \right) \cdot \left(1 + \frac{1}{T_p} + \left((R_{mk} - \bar{R}_m)^2 / \sum_{t=1}^{T_p} (R_{mt} - \bar{R}_m)^2 \right) \right) \right]^{\frac{1}{2}} \quad (4)$$

$$SPE_{pk} = \frac{\hat{e}_{pk}}{s_p} \quad (5)$$

$$Z_{spe} = \left(\sum_{p=1}^N SPE_{pk} \right) / \left(\sum_{p=1}^N \frac{T_p - 2}{T_p - 4} \right)^{\frac{1}{2}} \quad (6)$$

- Where, s_p = standard error of the predicted value for portfolio p,
 \bar{R}_m = equally-weighted mean daily market returns over the estimation period,
 SPE_{pk} = Standardized prediction error for portfolio p on day k,
 Z_{spe} = normalized sum of standardized prediction errors for all portfolios on day k, and
 T_p = number of observations in the estimation period for portfolio p.

Pair-matched differences between similar and dissimilar portfolios were also determined. The differences measured the movement of each portfolio relative to the other rather than to zero. The differences formed a proxy for the relationship between the two portfolios, which was purged of all

commonalties. If the information transfers were industry wide, firms in both portfolios would respond. If only a few similar firms respond, the information transfers would be captured as one of the sources of difference between portfolios. To measure the pair-matched differences, the difference in returns between similar and dissimilar portfolios were calculated, standardized (5), and the significance of the standardized differences measured as normalized sums (6).

RESULTS AND DISCUSSION

As summarized in Table 1, the overall market reaction of announcement firms to the announcement of cash tender offers for the repurchase of common stock was a highly significant ($\alpha = 0.01$) mean standardized prediction error (MSPE) of 1.572 on day -1. Consistent with the findings of Hertzell [1991], the portfolio of similar firms did not support the existence of information transfers by failing to demonstrate market returns that were significantly different from zero.

Table 1
Mean Standardized Prediction Errors for All Firms

Days	Announcement Firms (N = 32)	Nonannouncement Firms-Similar (N = 120)	Nonannouncement Firms-Dissimilar (N = 107)	Pair-Matched Differences [†]
-2	0.013	0.250	0.066	-0.001
-1	1.572***	0.294	-0.103	0.370*
0	0.119	0.125	-0.022	-0.119
1	0.188	-0.191	0.228	-0.293
2	0.241	-0.023	0.416**	-0.231

*, **, *** are the 0.10, 0.05, and 0.01 level of significance, respectively. Days are the five days surrounding the announcement date (day 0). N is the number of firms in the portfolio.

The standardized prediction errors for differences between similar and dissimilar portfolios were based on pair-matched daily differences.

However, the pair-matched differences demonstrated a significant MSPE of 0.370 ($\alpha = 0.10$) that suggested information transfers associated with the announcement of a repurchase of common stock might exist since the portfolio of similar firms demonstrated a more positive reaction than the portfolio of dissimilar firms.

However, the signal provided to the market by the repurchase announcement is a complex signal. There are several factors that may contribute to the magnitude of the market reaction: motivation, premium, size, analyst following, and method of repurchase [e.g., Vermaelen, 1981; Vermaelen 1984; Nathan and Sobel, 1980; Comment and Jarrell, 1991; Best and Best, 1995; Persons, 1994]. These factors are not independent. Persons [1994] suggested that each repurchase method have characteristics that determine its suitability for accomplishment of management's purpose. Furthermore, management's purposes may be as varied as defense against hostile takeover, investment, or reduction in clerical costs.

There are three methods by which a cash tender offer for the repurchase of common stock can be accomplished: fixed-price, Dutch auction, and odd-lot repurchases. In a fixed-price repurchase, the firm sets the repurchase price and acquires the shares tendered. In a Dutch auction, the number of shares to be repurchased is set. A range of acceptable offers is also given. Management accepts the lowest bids first until the desired number of shares has been reached. In an odd-lot repurchase, the firm sends letters to shareholders of less than 100 shares of common stock and offers to reacquire their holdings at close to market price.

A Dutch auction is usually associated with a smaller premium than a fixed-price repurchase. An odd-lot repurchase is associated with the smallest premium or share numbers of the three methods.

The sample was divided by method of repurchase as a proxy for the complexity of the signal. As summarized in Table 2, the fixed price repurchase firms demonstrated a significant MSPE of 1.836 ($\alpha = 0.01$) on day -1 which corresponded to a significant MSPE of 0.422 ($\alpha = 0.10$) for similar nonannouncement firms on the same day. This small significant positive response is consistent with expectations based on Pownall and Waymire [1989]. However, in addition to the small positive abnormal returns on day -1, the similar firms demonstrated significant negative MSPE of 0.516 ($\alpha = 0.05$) on day 1. This suggests that the repurchase announcement be interpreted as “good news” by some investors and “bad news” by others.

Table 2
Mean Standardized Prediction Errors by Repurchase Type

Type	Days	Announcement Firms	Nonannouncement Firms-Similar	Nonannouncement Firms-Dissimilar	Pair-Matched Differences [†]
Fixed-price		(N = 19)	(N = 74)	(N = 74)	
	-2	0.089	0.145	0.090	-0.082
	-1	1.836***	0.422*	-0.142	0.538**
	0	0.022	0.094	-0.041	-0.171
	1	0.128	-0.516**	0.285	-0.630**
	2	0.428*	0.044	0.305	-0.124
Dutch auction		(N = 6)	(N = 16)	(N = 18)	
	-2	-0.406	0.591	-0.228	0.511**
	-1	1.755***	0.317	0.054	0.188
	0	0.088	0.037	0.023	-0.120
	1	0.056	0.514	0.534	0.083
	2	0.089	-0.216	0.836**	-0.807**
Odd-lot		(N = 7)	(N = 30)	(N = 15)	
	-2	0.285	0.238	0.397	-0.389
	-1	0.045	-0.445	-0.151	-0.152
	0	0.625	0.409	-0.001	0.127
	1	0.675	0.299	-0.554	0.743
	2	-0.419	-0.047	0.311	0.069

*, **, *** are the 0.10, 0.05, and 0.01 level of significance, respectively. Days are the five days surrounding the announcement date (day 0). N is the number of firms in the portfolio.

[†]The standardized prediction errors for differences between similar and dissimilar portfolios were based on pair-matched daily differences.

If the repurchase announcement signaled the market that the announcement firm’s management believes the firm to be undervalued [Vermaelen 1981], the announcement might be received as good news or bad news for other firms in that industry. If the announcement firm is undervalued because of plans to improve its competitive position, it could be bad news for competing firms. If the announcement firm is undervalued because the industry is on the rise, it could be good news for all firms in the industry. If, however, the announcement firm is perceived as an allocation of the firm’s resources to innocuous noncompetitive activities, only competitors would perceive this announcement as good news. The data indicate that some of the nonannouncement firms move in a positive direction, some move in a negative direction, and others do not at all. This suggests the repurchase announcement may contain competitive information with no significant industry-wide component.

Dutch auction repurchase firms also demonstrated a significant positive MSPE of 1.755 ($\alpha = 0.01$) on day -1. This response was consistent with Comment and Jarrell [1991] in that it was both significant and of a lesser magnitude than the fixed-price repurchase announcement. The only significant

response from the nonannouncement firms was that the dissimilar portfolio demonstrated a MSPE of 0.836 ($\alpha = 0.05$) on day 2. While there were no other announcements that could explain this response, the fact that this reaction occurred among the dissimilar firms on day 2 makes it less than compelling evidence of information transfer.

The odd-lot repurchase did not result in a significant market reaction for the announcement firms. This is consistent with the assumptions made when odd-lot repurchases were eliminated from samples used in the classic studies of common stock repurchases (Masulis, 1980; Dann, 1981; Vermaelen, 1981). Furthermore, the odd-lot repurchases provided no support for the existence of information transfer.

SUMMARY AND CONCLUSION

This research suggests that information transfers may occur in response to an announcement of a fixed-price cash tender offer for the repurchase of common stock. However, this is a complex financial transaction that cannot be easily understood without controlling for factors contributing to its market impact. Once the sample was divided by method of repurchase as a proxy for complexity, fixed-price repurchase announcements were associated with evidence of both positive and negative market reactions among similar firms. Consistent with Pownall and Waymire [1991], this evidence was interpreted as weak and inconsistent support for information transfers. The Dutch auction and odd-lot repurchases failed to provide unambiguous support for information transfers.

These findings were inconsistent with Hertzler [1991]. There were at least three factors that may have contributed to this difference. First, our research defined industry according to the four-digit SIC code from COMPUSTAT rather than CRSP. Guenther and Rosman [1994] suggested that COMPUSTAT assigns a firm to a four-digit SIC code only if over 50 percent of the firm's sales were associated with a segment within this classification. CRSP assigns a firm to the SIC code of the segment with the most sales. As a result, it is possible to have two firms assigned to a CRSP four-digit SIC code which have a less meaningful business relationship than would exist among firms in a four-digit SIC code from COMPUSAT. Second, in this sample there was no indication of information leakage prior to the announcement. This avoids the problem of event date ambiguity and spreading any market reaction over the time in which the information leaks into the market. Finally, abnormal returns were not aggregated over time to avoid a possible loss of information due to the weak and inconsistent nature of the anticipated market response.

While our research provides only weak support for information transfers in association with announced repurchases of common stock, there were limitations to the research design. First, sample size was limited to avoid confounding factors. Second, formation of similar and dissimilar portfolios did not result in an ideal separation of firms. Some of the firms classified as dissimilar responded to the announcement while some of the similar firms did not respond. Both of these limitations biased against finding support for information transfers; yet, the results still provided some support for the phenomenon.

Our findings suggest that more research in this area is warranted. Future research should control for the complexity of the transaction and focus on possible information transfers among firms with strong business relationships such as major competitors.

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